Teacher's Scoring Guide

Grade 7
Mathematics

Fall 2007

Indiana Statewide Testing for Educational Progress

49928-W

INTRODUCTION

During the fall of 2007, Indiana students in Grades 3 through 10 participated in the administration of *ISTEP+*. The test for *ISTEP+* Fall 2007 consisted of a multiple-choice section and an applied skills section. For the fall testing, the multiple-choice section was machine-scored. The applied skills section, which consisted of open-ended questions, was hand-scored.

The test results for both the multiple-choice and applied skills sections were returned to the schools in late November 2007. Copies of student responses to the open-ended questions were returned to the schools in early December 2007. It is the expectation of the Indiana Department of Education that schools will take this opportunity to invite students and parents to sit down with teachers to discuss the results. To support this endeavor, the Indiana Department of Education has prepared the following *Teacher's Scoring Guide*. The purpose of this guide is to help teachers to:

- understand the methods used to score the *ISTEP+* Fall 2007 applied skills section, and
- discuss and interpret these results with students and parents.

In order to use this guide effectively, you will also need the Student Report and a copy of the student's work.

There are three scoring guides for Grade 7, English/Language Arts, Mathematics, and Science. In this Mathematics guide, you will find:

- an introduction,
- a list of the Mathematics Grade 6 Indiana Academic Standards,*
- rubrics (scoring rules) used to score the open-ended questions,
- anchor papers that are actual examples of student work (transcribed in this guide for clarity and ease of reading), and
- descriptions of the ways in which the response meets the rubric criteria for each of the score points.

When you review the contents of the scoring guide, keep in mind that this guide is an overview. If you have questions, write via e-mail (istep@doe.state.in.us) or call the Indiana Department of Education at (317) 232-9050.

* Because *ISTEP+* is administered early in the fall, the Grade 7 test is based on the academic standards for Grade 6.

INTRODUCTION TO THE MATHEMATICS APPLIED SKILLS SECTION

The applied skills section that students responded to this past fall in Grade 7 allowed the students to demonstrate their understanding of Mathematics in a variety of ways, such as applying formulas, explaining a solution, transforming a figure, or interpreting a table or graph.

STRUCTURE

The applied skills section for Grade 7 Mathematics was divided into two tests, Test 7 and Test 8. Each test consisted of seven open-ended questions. Students were permitted to use calculators on Test 8 but **not** on Test 7.

SCORING

Each open-ended question was scored according to its own rubric. A rubric is a description of student performance that clearly articulates the requirements for each of the score points. Scoring rubrics are essential because they ensure that all papers are scored objectively. Each rubric for this administration of the *ISTEP+* Grade 7 Mathematics assessment has a maximum possible score of two or three score points.

NOTE: Images of the questions and student work have been reduced to fit the format of this guide. As a result, figures and diagrams in measurement questions will appear smaller in this guide than in the actual test book.

Rubrics are established prior to testing to describe the performance criteria for each score point. The performance criteria determine the number of score points possible for each question. This process ensures that all responses are judged objectively.

1. Students should not be penalized for omitting:
   - degree symbols
   - dollar signs ($) or cent signs (¢)
   - zeros for place holders; for example, either 0.75 or .750 could be used
   - labels for word problems; for example, *miles*

     NOTE: Students WILL be penalized for use of incorrect labels.

2. Students should not be penalized for:
   - spelling or grammar errors
   - using abbreviations; for example, *ft* or *feet* would be acceptable

3. Students should be given credit for:
   - entries in the workspace that indicate understanding of a complete process even if the response on the answer line is incorrect (i.e., the student would receive partial credit for questions with rubrics that allow for scoring the work)
   - answers not written on the answer line; for example, an answer could be given in the workspace or in the explanation (however, in some cases, because of the multiple calculations in the workspace, placement of an answer on the answer line is necessary to determine which response the student intended). Students WILL be penalized for incorrect answers written on the answer line even if the correct answer appears in the workspace.

4. Students should be given credit for:
   - bar graphs with bars of any width
   - bar graphs with either horizontal or vertical bars
   - circle graphs with data presented in any order
   - line graphs only if lines connect the points

CONDITION CODES

If a response is unscorable, it is assigned one of the following condition codes:

A Blank/No response/Refusal
B Illegible
C Written predominantly in a language other than English
D Insufficient response/Copied from text

MATHEMATICS GRADE 6
INDIANA ACADEMIC STANDARDS

❑ **Number Sense**
Students compare and order positive and negative integers, decimals, fractions, and mixed numbers. They find multiples and factors.

❑ **Computation**
Students solve problems involving addition, subtraction, multiplication, and division of integers. They solve problems involving fractions, decimals, ratios, proportions, and percentages.

❑ **Algebra and Functions**
Students write verbal expressions and sentences as algebraic expressions and equations. They evaluate algebraic expressions, solve simple linear equations, and graph and interpret their results. They investigate geometric relationships and describe them algebraically.

❑ **Geometry**
Students identify, describe, and classify the properties of plane and solid geometric shapes and the relationships between them.

❑ **Measurement**
Students deepen their understanding of the measurement of plane and solid shapes and use this understanding to solve problems. They calculate with temperature and money, and choose appropriate units of measure in other areas.

❑ **Data Analysis and Probability**
Students compute and analyze statistical measures for data sets. They determine theoretical and experimental probabilities and use them to make predictions about events.

❑ **Problem Solving**
Students make decisions about how to approach problems and communicate their ideas. Students use strategies, skills, and concepts in finding and communicating solutions to problems. Students determine when a solution is complete and reasonable and move beyond a particular problem by generalizing to other situations.

Problem Solving is identified as a Process Skill in the Indiana Academic Standards. To ensure that the *ISTEP+* questions that assess this Process Skill are grade-appropriate and that the questions use skills that are contained in the standards, these questions are developed by including at least two different indicators from Content Skills in addition to the indicator from the Process Skill. Some of the Content Standards included in the Content Skills are Computation, Geometry, and Algebra. The additional indicators may be from the same or different Content Skills.

The Content Skills used for each of the Process Skill questions in the Grade 7 applied skills section are shown in the following chart.

PROCESS SKILL QUESTIONS

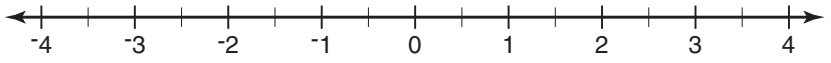
Question	Process Skill	Content Skills *Item may map to more than one indicator in a standard.*
Test 7		
4	Problem Solving	Computation, Algebra and Functions
Test 8		
2	Problem Solving	Computation, Measurement
3	Problem Solving	Computation, Measurement
4	Problem Solving	Computation, Measurement

Test 7—Question 1: Number Sense

1 Look at the numbers below.

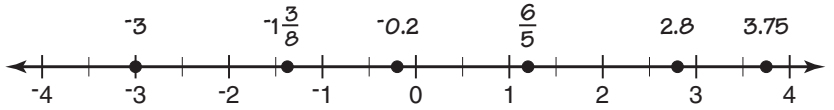
$-3 \qquad -1\frac{3}{8} \qquad 2.8 \qquad \frac{6}{5} \qquad -0.2 \qquad 3.75$

Plot each of these numbers on the number line below. Write the number above each point plotted.



Exemplary Response:

•



Rubric:

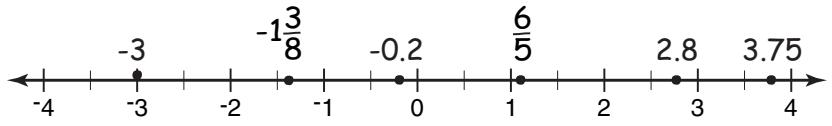
2 points	Exemplary response
1 point	All points correctly plotted but not labeled or incorrectly labeled OR Four or five points correctly plotted and labeled
0 points	Other

SCORE POINT 2

1 Look at the numbers below.

-3 $-1\frac{3}{8}$ 2.8 $\frac{6}{5}$ -0.2 3.75

Plot each of these numbers on the number line below. Write the number above each point plotted.



Test 7—Question 1
Score Point 2

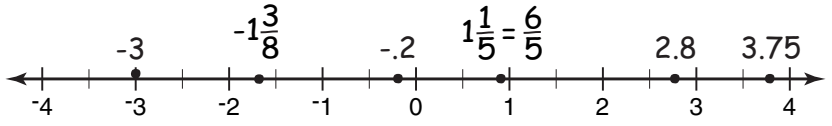
This response matches the exemplary response contained in the rubric. The response shows all six points plotted and labeled correctly. The response receives a Score Point 2.

SCORE POINT 1

1 Look at the numbers below.

-3 $-1\frac{3}{8}$ 2.8 $\frac{6}{5}$ -0.2 3.75

Plot each of these numbers on the number line below. Write the number above each point plotted.



Test 7—Question 1
Score Point 1

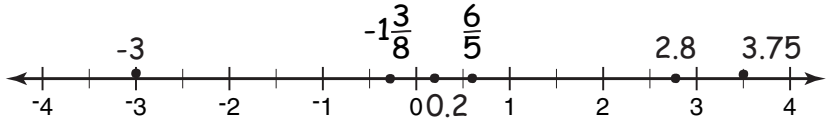
This response shows only four points plotted and labeled correctly. The two fractions are plotted incorrectly. Therefore, this response receives a Score Point 1.

SCORE POINT 0

1 Look at the numbers below.

-3 $-1\frac{3}{8}$ 2.8 $\frac{6}{5}$ -0.2 3.75

Plot each of these numbers on the number line below. Write the number above each point plotted.



Test 7—Question 1
Score Point 0

This response shows only two points plotted and labeled correctly. Therefore, this response receives a Score Point 0.

Test 7—Question 2: Computation

2 George is making a batch of cookies. The recipe states that he needs $\frac{3}{4}$ cup of sugar.

If George reduces the recipe to make half the number of cookies, how much sugar will he need?

Show All Work

Answer _____ cup

Exemplary Response:

- $\frac{3}{8}$ cup

Sample Process:

- $\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

SCORE POINT 2

2 George is making a batch of cookies. The recipe states that he needs $\frac{3}{4}$ cup of sugar.

If George reduces the recipe to make half the number of cookies, how much sugar will he need?

Show All Work

$$\frac{3}{4} \times \frac{1}{2} = \frac{3}{8}$$

Answer $\frac{3}{8}$ cup

Test 7—Question 2
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives the correct answer of $\frac{3}{8}$ cup. The response receives a Score Point 2.

SCORE POINT 1

2 George is making a batch of cookies. The recipe states that he needs $\frac{3}{4}$ cup of sugar.

If George reduces the recipe to make half the number of cookies, how much sugar will he need?

Show All Work

$$\frac{3}{4} \div \frac{2}{1} = \frac{3}{4} \times \frac{1}{2} = \frac{4}{8} = \frac{1}{2}$$

Answer $\frac{1}{2}$ cup

Test 7—Question 2
Score Point 1

This response shows a correct complete process. However, the student makes an error in computation when multiplying $\frac{3}{4}$ and $\frac{1}{2}$, which results in an incorrect answer. Therefore, this response receives a Score Point 1.

Test 7—Question 2
Score Point 0

This response shows an incorrect process and an incorrect answer. Therefore, this response receives a Score Point 0.

SCORE POINT 0

2 George is making a batch of cookies. The recipe states that he needs $\frac{3}{4}$ cup of sugar.

If George reduces the recipe to make half the number of cookies, how much sugar will he need?

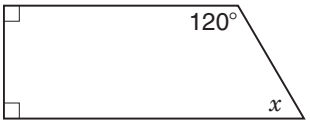
Show All Work

$$\begin{array}{r} 3 \\ \times\ 4 \\ \hline 12 \end{array} \qquad 1\frac{2}{4}$$

Answer $1\frac{2}{4}$ cup

Test 7—Question 3: Geometry

3 Look at the quadrilateral below.



On the lines below, explain how to determine the measure of angle x without the use of a protractor.

What is the measure of angle x?

Answer _____ °

Exemplary Response:

- The sum of the interior angles of any quadrilateral must equal 360 degrees. Add the three angles and subtract them from 360 degrees to find the missing angle.

OR

- Other valid explanation

AND

- 60°

Rubric:

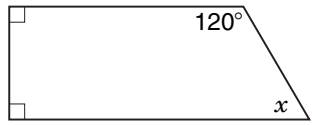
2 points	Exemplary response
1 point	One correct component
0 points	Other

Test 7—Question 3
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives a valid explanation and the correct answer of 60°. Therefore, this response receives a Score Point 2.

SCORE POINT 2

3 Look at the quadrilateral below.



On the lines below, explain how to determine the measure of angle x without the use of a protractor.

With any quadrilateral you can add up all the angles and it will equal 360°. If you are missing the measurement of one angle, you can just add up the rest and subtract it by 360.

What is the measure of angle x?

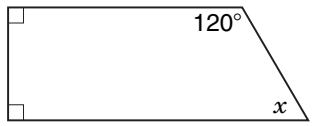
Answer 60 °

Test 7—Question 3
Score Point 1

This response shows only a correct answer of 60°. The student gives an incomplete explanation on how to determine the missing angle. Therefore, this response receives a Score Point 1.

SCORE POINT 1

3 Look at the quadrilateral below.



On the lines below, explain how to determine the measure of angle x without the use of a protractor.

A quadrilateral must equal 360°.

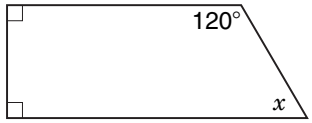
What is the measure of angle x?

$$\begin{array}{r} {\scriptstyle 1} \\ 90 \\ 90 \\ \hline \end{array} \begin{array}{r} 180 \\ 120 \\ 300 \end{array}$$

Answer 60 °

SCORE POINT 0

3 Look at the quadrilateral below.



On the lines below, explain how to determine the measure of angle x without the use of a protractor.

Angle x is an acute angle so it has to be less than 90°.

What is the measure of angle x?

Answer 70 °

Test 7—Question 3
Score Point 0

This response gives an incorrect explanation and an incorrect answer. Therefore, this response receives a Score Point 0.

Test 7—Question 4: Problem Solving

4 As a part of her cell phone plan, Margaret can use 900 minutes each month without additional charges.

This month, Margaret has already used 684 of her minutes. She is charged $0.35 for each additional minute over her limit of 900 minutes.

If Margaret uses 313 more minutes this month, how much will she be charged for minutes that go over her 900-minute plan?

Show All Work

Answer $ _____

Exemplary Response:

- $33.95

AND

- Correct complete process

Sample Process:

- $684 + 313 = 997$

  $997 - 900 = 97$

  $97 \times \$0.35 = \$33.95$

OR

- Other valid process

Rubric:

3 points	Exemplary response
2 points	Correct answer only OR Correct complete process; error in computation
1 point	Correctly finds number of minutes left in her plan OR Correctly finds total number of minutes used OR Correctly finds the number of minutes used over her limit
0 points	Other

SCORE POINT 3

4 As a part of her cell phone plan, Margaret can use 900 minutes each month without additional charges.

This month, Margaret has already used 684 of her minutes. She is charged $0.35 for each additional minute over her limit of 900 minutes.

If Margaret uses 313 more minutes this month, how much will she be charged for minutes that go over her 900-minute plan?

Show All Work

684 + 313 = 997

997 − 900 = 97 min

97 × .35 = 485 + 2910 = $33.95

Answer $ 33.95

Test 7—Question 4 Score Point 3

This response matches the exemplary response contained in the rubric. The student shows a correct complete process and gives the correct answer of $33.95. The response receives a Score Point 3.

SCORE POINT 2

4 As a part of her cell phone plan, Margaret can use 900 minutes each month without additional charges.

This month, Margaret has already used 684 of her minutes. She is charged $0.35 for each additional minute over her limit of 900 minutes.

If Margaret uses 313 more minutes this month, how much will she be charged for minutes that go over her 900-minute plan?

Show All Work

684 + 313 = 997

0.35 × 97 = 2.55 + 31.50 = $34.05

Answer $ 34.05

Test 7—Question 4 Score Point 2

This response shows a correct complete process. However, the student makes an error in computation when multiplying 0.35 and 97, which results in an incorrect answer. Therefore, this response receives a Score Point 2.

Test 7—Question 4
Score Point 1

This response shows only a correct response for the total number of minutes used. Therefore, this response receives a Score Point 1.

SCORE POINT 1

4 As a part of her cell phone plan, Margaret can use 900 minutes each month without additional charges.

This month, Margaret has already used 684 of her minutes. She is charged $0.35 for each additional minute over her limit of 900 minutes.

If Margaret uses 313 more minutes this month, how much will she be charged for minutes that go over her 900-minute plan?

Show All Work

$$\begin{array}{r} 684 \\ +\ 313 \\ \hline 997. \end{array} \qquad .35\overline{)\,97} \;\; \begin{array}{r} 29 \\ \\ 70 \\ \hline 27 \\ 27 \\ \hline 00 \end{array}$$

Answer $ She wil have to Pay $29.00

Test 7—Question 4
Score Point 0

This response shows an incorrect process and an incorrect answer. Therefore, this response receives a Score Point 0.

SCORE POINT 0

4 As a part of her cell phone plan, Margaret can use 900 minutes each month without additional charges.

This month, Margaret has already used 684 of her minutes. She is charged $0.35 for each additional minute over her limit of 900 minutes.

If Margaret uses 313 more minutes this month, how much will she be charged for minutes that go over her 900-minute plan?

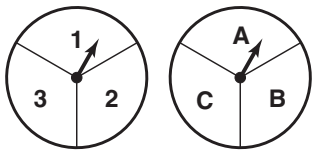
Show All Work

$$\begin{array}{r} 313 \\ \times\ .35 \\ \hline 1565 \\ 9390 \\ \hline 109.55 \end{array}$$

Answer $ 109.55

Test 7—Question 5: Data Analysis and Probability

5 Gloria is playing a game that uses a number spinner and a letter spinner. Each spinner has three equal sections, as shown below.



In the box below, write all possible combinations of numbers and letters from the two spinners.

What is the probability that the number spinner will land on 2 and the letter spinner will land on C?

Answer _____

Exemplary Response:

- A1, A2, A3,
  B1, B2, B3,
  C1, C2, C3

OR

- Other valid response

AND

- $\frac{1}{9}$

OR

- $0.\overline{1}$

OR

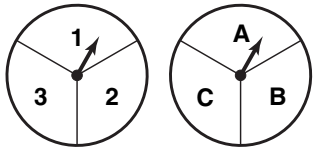
- $11.\overline{1}\%$

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

SCORE POINT 2

5 Gloria is playing a game that uses a number spinner and a letter spinner. Each spinner has three equal sections, as shown below.



In the box below, write all possible combinations of numbers and letters from the two spinners.

1-A, 1-B, 1-C, 2-A, 2-B, 2-C, 3-A, 3-B, 3-C

9 combos

What is the probability that the number spinner will land on 2 and the letter spinner will land on C?

Answer 1/9

Test 7—Question 5
Score Point 2

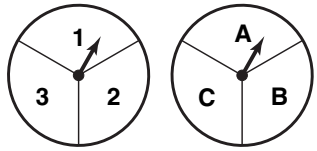
This response matches the exemplary response contained in the rubric. The student shows all nine correct combinations and gives the correct answer of $\frac{1}{9}$. The response receives a Score Point 2.

Test 7—Question 5
Score Point 1

This response shows all nine correct combinations. However, the student gives an incorrect answer of $\frac{2}{9}$. Therefore, the response receives a Score Point 1.

SCORE POINT 1

5 Gloria is playing a game that uses a number spinner and a letter spinner. Each spinner has three equal sections, as shown below.



In the box below, write all possible combinations of numbers and letters from the two spinners.

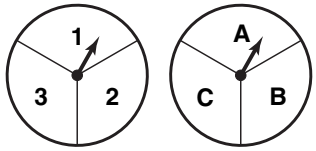
1A/1B/1C/2A/2B/2C/3A/3B/3C

What is the probability that the number spinner will land on 2 and the letter spinner will land on C?

Answer $\frac{2}{9}$

SCORE POINT 0

5 Gloria is playing a game that uses a number spinner and a letter spinner. Each spinner has three equal sections, as shown below.



In the box below, write all possible combinations of numbers and letters from the two spinners.

A B C
1 2 3

What is the probability that the number spinner will land on 2 and the letter spinner will land on C?

Answer C 2

Test 7—Question 5
Score Point 0

This response shows only three correct combinations and the student gives an incorrect answer. Therefore, this response receives a Score Point 0.

Test 7—Question 6: Algebra and Functions

6 Michael deposited \$163 into his savings account. He now has \$971 in his savings account.

On the line below, write an equation that can be used to show the amount of money (m) in Michael's savings account before his deposit.

Equation _____

Now solve the equation you wrote. How much money was in Michael's savings account before his deposit?

Answer \$_____

Exemplary Response:

- $m + 163 = 971$

OR

- $m = 971 - 163$

OR

- Other valid equation

AND

- \$808

NOTE: Award 1 point for a correct solution based on an incorrect equation.

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

SCORE POINT 2

6 Michael deposited $163 into his savings account. He now has $971 in his savings account.

On the line below, write an equation that can be used to show the amount of money (m) in Michael's savings account before his deposit.

Equation m + 163 = 971

Now solve the equation you wrote. How much money was in Michael's savings account before his deposit?

$$\begin{array}{r} {}^{6}\cancel{9}^{1}71 \\ 163 \\ \hline 808 \end{array}$$

Answer $ 808

Test 7—Question 6 Score Point 2

This response matches the exemplary response contained in the rubric. The student shows a correct equation and gives the correct answer of $808. The response receives a Score Point 2.

SCORE POINT 1

6 Michael deposited $163 into his savings account. He now has $971 in his savings account.

On the line below, write an equation that can be used to show the amount of money (m) in Michael's savings account before his deposit.

Equation $163 + m = $971

Now solve the equation you wrote. How much money was in Michael's savings account before his deposit?

Answer $ 814

Test 7—Question 6 Score Point 1

This response shows a correct equation with an incorrect answer. Therefore, this response receives a Score Point 1.

Test 7—Question 6
Score Point 0

This response shows an incorrect equation and an incorrect answer. Therefore, this response receives a Score Point 0.

SCORE POINT 0

6 Michael deposited $163 into his savings account. He now has $971 in his savings account.

On the line below, write an equation that can be used to show the amount of money (m) in Michael's savings account before his deposit.

Equation 163 + 971 =

Now solve the equation you wrote. How much money was in Michael's savings account before his deposit?

$$\begin{array}{r} {\scriptstyle 1} \\ 971 \\ 163 \\ \hline 1134 \end{array}$$

Answer $ 1134

Test 7—Question 7: Algebra and Functions

7 Evaluate: $8 \times (12 \div 3 + 2) + 4 \div 2$

Show All Work

Answer _____

Exemplary Response:

- 50

Sample Process:

- $8 \times (12 \div 3 + 2) + 4 \div 2$
  $= 8 \times (4 + 2) + 4 \div 2$
  $= 8 \times 6 + 4 \div 2$
  $= 48 + 4 \div 2$
  $= 48 + 2$
  $= 50$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct order of operations; error in computation
0 points	Other

Test 7—Question 7
Score Point 2

This response matches the exemplary response contained in the rubric. The student correctly follows the order of operations and gives a correct answer of 50. The response receives a Score Point 2.

SCORE POINT 2

7 Evaluate: $8 \times (12 \div 3 + 2) + 4 \div 2$

Show All Work

$8 \times (12 \div 3 + 2) + 4 \div 2$
$8 \times (6) + 4 \div 2$
$48 + 4 \div 2$
$48 + 2$
50

Answer 50

Test 7—Question 7
Score Point 1

This response shows the correct complete process for the order of operations. However, the student makes an error in computation when multiplying 6 and 8, which results in an incorrect answer. Therefore, this response receives a Score Point 1.

SCORE POINT 1

7 Evaluate: $8 \times (12 \div 3 + 2) + 4 \div 2$

Show All Work

$12 \div 3 = 4 + 2 = 6 \times 8 = 46 + 4 \div 2 = 48$

Answer 48

Test 7—Question 7
Score Point 0

This response shows an incorrect order of operations and an incorrect answer. Therefore, this response receives a Score Point 0.

SCORE POINT 0

7 Evaluate: $8 \times (12 \div 3 + 2) + 4 \div 2$

Show All Work

$8 \times 4 + 2 + 4 \div 2$
$32 + 2 + 4 \div 2$
$34 + 4 \div 2$
$38 \div 2$
14

$2\overline{)38}$ 14, -28, 1

Answer 14

Test 8—Question 1: Data Analysis and Probability

1 Dominic measured the heights, in inches, of fourteen of his classmates. His results are shown below.

55	59	50	68	62	64	57
48	60	67	71	51	64	52

Plot Dominic's results on the stem-and-leaf plot below.

Student Heights

Stem	Leaf

Exemplary Response:

- **Student Heights**

Stem	Leaf
4	8
5	0 1 2 5 7 9
6	0 2 4 4 7 8
7	1

Rubric:

2 points	Exemplary response
1 point	8 to 13 correct entries
0 points	Other

Test 8—Question 1
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives all 14 correct entries in the stem-and-leaf plot. The response receives a Score Point 2.

SCORE POINT 2

1 Dominic measured the heights, in inches, of fourteen of his classmates. His results are shown below.

55 59 50 68 62 64 57
48 60 67 71 51 64 52

Plot Dominic's results on the stem-and-leaf plot below.

Student Heights

Stem	Leaf
4	8
5	0 1 2 5 7 9
6	0 2 4 4 7 8
7	1

SCORE POINT 1

1 Dominic measured the heights, in inches, of fourteen of his classmates. His results are shown below.

55	59	50	68	62	64	57
~~48~~	60	67	71	51	64	52

Plot Dominic's results on the stem-and-leaf plot below.

Student Heights

Stem	Leaf
4	8
5	0, 1, 2, 5, 9
6	0, 2, 4, 4, 7
7	1

Test 8—Question 1
Score Point 1

This response shows only 12 correct entries in the stem-and-leaf plot. Therefore, this response receives a Score Point 1.

Test 8—Question 1
Score Point 0

This response does not show any correct entries in the stem-and-leaf plot. Therefore, this response receives a Score Point 0.

SCORE POINT 0

1 Dominic measured the heights, in inches, of fourteen of his classmates. His results are shown below.

55	59	50	68	62	64	57
48	60	67	71	51	64	52

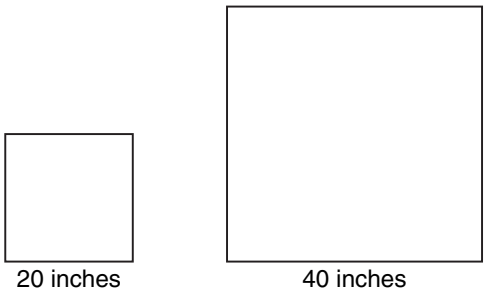
Plot Dominic's results on the stem-and-leaf plot below.

Student Heights

Stem	Leaf
48–59	5
60–69	6
70–79	1

Test 8—Question 2: Problem Solving

2 Look at the squares below.



Square A **Square B**

What is the ratio of the perimeter of Square A to the perimeter of Square B?

Show All Work

Answer _____

What is the ratio of the area of Square A to the area of Square B?

Show All Work

Answer _____

Are the ratios equivalent? On the lines below, explain why or why not.

_____

_____

_____

_____

_____

Exemplary Response:

- $\frac{80}{160}$ or $\frac{1}{2}$ or 1:2 or 1 to 2

OR

- Other valid response

AND

- Correct complete process

Sample Process:

- $20 \times 4 = 80$

  $40 \times 4 = 160$

  $\frac{80}{160} = \frac{1}{2}$

OR

- Other valid process

AND

- $\frac{400}{1{,}600}$ or $\frac{1}{4}$ or 1:4 or 1 to 4

OR

- Other valid response

AND

- Correct complete process

Sample Process:

- $20 \times 20 = 400$

  $40 \times 40 = 1{,}600$

  $\frac{400}{1{,}600} = \frac{1}{4}$

OR

- Other valid process

AND

- The ratios are not equivalent because one represents the relationship of the perimeters and one represents the relationship of the areas, which are not the same.

OR

- Other valid response

NOTES: Award credit for process if student finds either correct perimeters or correct areas.

Award credit for correct explanation based on incorrect ratios.

Rubric:

3 points Exemplary response

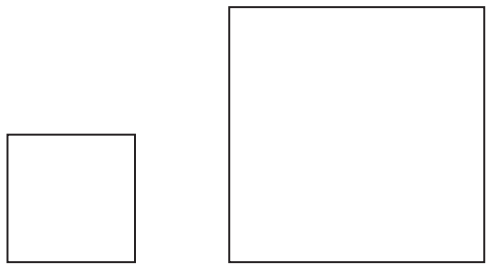
2 points Four correct components

1 point Two or three correct components

0 points Other

SCORE POINT 3

2 Look at the squares below.



Square A **Square B**

What is the ratio of the perimeter of Square A to the perimeter of Square B?

Show All Work

$$\begin{array}{r} 20 \\ \times\ 4 \\ \hline 80 \end{array} \qquad \begin{array}{c} 80 \text{ to } 160 \\ 40 \text{ to } 80 \\ 1 \text{ to } 2 \end{array} \qquad \begin{array}{r} 40 \\ \times\ 4 \\ \hline 160 \end{array}$$

Answer 1 to 2

What is the ratio of the area of Square A to the area of Square B?

Show All Work

$$\begin{array}{r} 20 \\ \times\ 20 \\ \hline 400 \end{array} \text{ A of A} \qquad \begin{array}{r} 40 \\ \times\ 40 \\ \hline 1600 \end{array} \text{ A of B} \qquad \begin{array}{c} 400 \text{ to } 1600 \\ 1 \text{ to } 4 \end{array} \qquad \begin{array}{r} 4 \\ 400\overline{)1600} \\ 1600 \\ \hline 0000 \end{array}$$

Answer 1 to 4

Are the ratios equivalent? On the lines below, explain why or why not.

No, because there are different formulas to get the area and perimeter which come out to be different numbers wich make the ratios not equivalent. 1 to 2 and 1 to 4 are different ratios.

Test 8—Question 2 Score Point 3

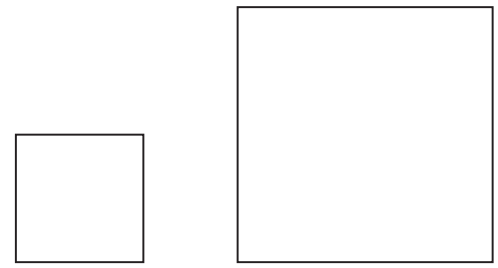
This response matches the exemplary response contained in the rubric. The student shows the correct complete process and the correct answers for the ratios of the perimeters and areas. The student also gives a correct explanation for why the ratios are not equivalent. The response receives a Score Point 3.

Test 8—Question 2
Score Point 2

This response shows the correct complete process and the correct answers for the ratios of the perimeters and areas. However, the student does not give a correct explanation for why the ratios are not equivalent. Therefore, this response receives a Score Point 2.

SCORE POINT 2

2 Look at the squares below.



Square A **Square B**

What is the ratio of the perimeter of Square A to the perimeter of Square B?

Show All Work

A. 80 B. 160

$$\begin{array}{r} 20 \\ \times\ 4 \\ \hline 80 \end{array} \qquad \begin{array}{r} 40 \\ \times\ 4 \\ \hline 160 \end{array}$$

Answer 80 to 160

What is the ratio of the area of Square A to the area of Square B?

Show All Work

A. 400
B. 1600

$$\begin{array}{r} 20 \\ \times\ 20 \\ \hline 400 \end{array} \qquad \begin{array}{r} 40 \\ \times\ 40 \\ \hline 1600 \end{array}$$

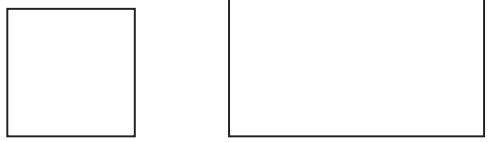
Answer 400 to 1600

Are the ratios equivalent? On the lines below, explain why or why not.

Yes, because it you divide each by 2 you will get them equivalent.

SCORE POINT 1

2 Look at the squares below.



Square A **Square B**

What is the ratio of the perimeter of Square A to the perimeter of Square B?

Show All Work

L • W
20 × 20 = 400
40 × 40 = 1,600

Answer 400:1,600

What is the ratio of the area of Square A to the area of Square B?

Show All Work

20 × 20 = 400
40 × 40 = 1,600

Answer 400:1,600

Are the ratios equivalent? On the lines below, explain why or why not.

Yes, because the formula for P = l • w and the formula for A = s^2, so it's practically the same formula.

Test 8—Question 2
Score Point 1

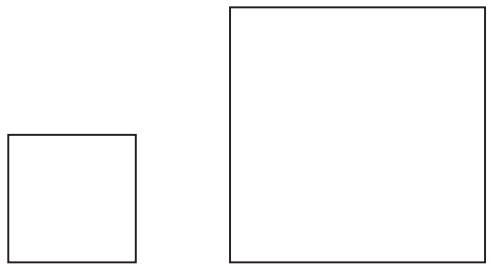
This response shows a correct complete process and a correct answer for the ratio of the areas. However, the student shows an incorrect process and an incorrect answer for finding the ratio of the perimeters and an incorrect explanation. Therefore, this response receives a Score Point 1.

Test 8—Question 2
Score Point 0

This response shows an incorrect process, which results in two answers that are not ratios. The student also has an incorrect explanation. Therefore, this response receives a Score Point 0.

SCORE POINT 0

2 Look at the squares below.



Square A **Square B**

What is the ratio of the perimeter of Square A to the perimeter of Square B?

Show All Work

40 - 20 = 20

Answer 40 - 20 = 20

What is the ratio of the area of Square A to the area of Square B?

Show All Work

Answer 20 - 40 = -20

Are the ratios equivalent? On the lines below, explain why or why not.

No because it is one number subtraced by another.

Test 8—Question 3: Problem Solving

3 A restaurant ran out of green beans Friday night and sent an employee to the store Saturday morning to buy enough to last through the day. The restaurant uses 35 pounds of green beans each night. The green beans are sold in $2\frac{1}{2}$-pound packages.

If each package costs $2.49, how much did it cost the employee to buy the green beans? Assume there was no tax.

Show All Work

Answer $ _____

Exemplary Response:

- $34.86

AND

- Correct complete process

Sample Process:

- $35 \div 2.5 = 14$

  $14 \times \$2.49 = \$34.86$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct answer only OR Correct complete process; error in computation
0 points	Other

Test 8—Question 3
Score Point 2

This response matches the exemplary response contained in the rubric. The student shows a correct complete process and gives the correct answer of $34.86. The response receives a Score Point 2.

SCORE POINT 2

3 A restaurant ran out of green beans Friday night and sent an employee to the store Saturday morning to buy enough to last through the day. The restaurant uses 35 pounds of green beans each night. The green beans are sold in $2\frac{1}{2}$-pound packages.

If each package costs $2.49, how much did it cost the employee to buy the green beans? Assume there was no tax.

Show All Work

$35 \div 2\frac{1}{2} \times 2.49$

Answer $ 34.86

Test 8—Question 3
Score Point 1

This response shows a correct complete process for finding the cost of the green beans. However, the student makes an error in computation when multiplying 2.49 and 14, which results in an incorrect answer. Therefore, this response receives a Score Point 1.

SCORE POINT 1

3 A restaurant ran out of green beans Friday night and sent an employee to the store Saturday morning to buy enough to last through the day. The restaurant uses 35 pounds of green beans each night. The green beans are sold in $2\frac{1}{2}$-pound packages.

If each package costs $2.49, how much did it cost the employee to buy the green beans? Assume there was no tax.

Show All Work

$2.5\overline{)35}$ 14

$$\begin{array}{r} {\scriptstyle 1\ 3}\\ \$249\\ \times\ \ 14\\ \hline {\scriptstyle 1\ 1}\\ 796\\ +\ 2490\\ \hline \$32.86 \end{array}$$

Answer $ 32.86

SCORE POINT 0

3 A restaurant ran out of green beans Friday night and sent an employee to the store Saturday morning to buy enough to last through the day. The restaurant uses 35 pounds of green beans each night. The green beans are sold in $2\frac{1}{2}$-pound packages.

If each package costs $2.49, how much did it cost the employee to buy the green beans? Assume there was no tax.

Show All Work

1
2
×4
35.00
2.49
31500
140000
700000
87.1500

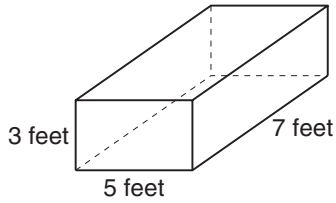
Answer $ 87.15

Test 8—Question 3
Score Point 0

This response shows an incorrect process and an incorrect answer. The student does not find the number of packages that must be purchased. Therefore, this response receives a Score Point 0.

Test 8—Question 4: Problem Solving

4 Kira bought the rectangular-shaped box shown in the diagram below.



She wants to fill $\frac{2}{3}$ of the box with soil. Soil costs $1.85 per cubic foot.

How much will it cost Kira to buy the soil?

Show All Work

Answer $ _____

Exemplary Response:

- $129.50

AND

- Correct complete process

Sample Process:

- $3 \times 5 \times 7 = 105$ cubic feet

  $105 \times \frac{2}{3} = 70$

  $70 \times \$1.85 = \$129.50$

OR

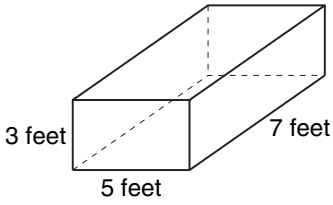
- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation OR Correct process for determining volume of one third of the box OR Correct process for determining volume of two thirds of the box
0 points	Other

SCORE POINT 2

4 Kira bought the rectangular-shaped box shown in the diagram below.



She wants to fill $\frac{2}{3}$ of the box with soil. Soil costs $1.85 per cubic foot.

How much will it cost Kira to buy the soil?

Show All Work

$3 \times 5 \times 7$
15×7
105

$3\overline{)105}$ $\quad 35$
35
70

70
$\times\ 1.85$

Answer $ 129.50

Test 8—Question 4
Score Point 2

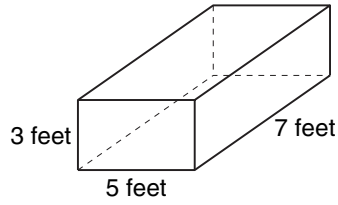
This response matches the exemplary response contained in the rubric. The student shows a correct complete process and gives the correct answer of $129.50. The response receives a Score Point 2.

Test 8—Question 4
Score Point 1

This response only shows the correct process for determining the volume of one third of the box. Therefore, this response receives a Score Point 1.

SCORE POINT 1

4 Kira bought the rectangular-shaped box shown in the diagram below.



She wants to fill $\frac{2}{3}$ of the box with soil. Soil costs $1.85 per cubic foot.

How much will it cost Kira to buy the soil?

Show All Work

$$\begin{array}{r} 185 \\ \times\ 35 \\ \hline {}_{1}925 \\ +\ 5550 \\ \hline 64.75 \end{array}$$

$A = lwh$
$A = 3(5)(7)$
$A = 15(7)$
$A = 105$

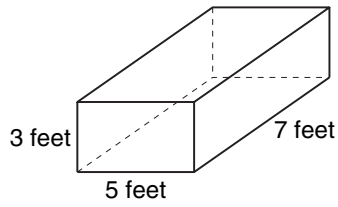
$$\begin{array}{r} {}^{3} \\ 15 \\ \times\ 7 \\ \hline 105 \end{array}$$

$$3\overline{)105}\quad \begin{array}{r} 35 \\ -9 \\ \hline 15 \\ -15 \\ \hline 0 \end{array}$$

Answer $ 64.75

SCORE POINT 0

4 Kira bought the rectangular-shaped box shown in the diagram below.



She wants to fill $\frac{2}{3}$ of the box with soil. Soil costs $1.85 per cubic foot.

How much will it cost Kira to buy the soil?

Show All Work

3
× 5
× 7

Answer $ 105

Test 8—Question 4
Score Point 0

This response shows an incomplete process with an incorrect answer. The student finds only the volume of the box. Therefore, this response receives a Score Point 0.

Test 8—Question 5: Data Analysis and Probability

5 The average weights, in pounds, of 9 different species of kangaroos in Australia are listed below.

70 71 71 72 73 80 83 85 88

What is the MEAN for this set of data?

Mean _____

What is the MODE for this set of data?

Mode _____

On the lines below, identify which measure, mean or mode, is more appropriate to use when describing the size of a kangaroo in Australia. Explain why the measure you chose is more appropriate.

_____

_____

_____

_____

_____

Exemplary Response:

- 77 and 71

AND

- The mean would be a better description of the overall weight of all the kangaroos. It is a better middle value for all of the numbers.

OR

- Other valid explanation

NOTE: Award 1 point for a correct explanation based upon an incorrect answer.

Rubric:

2 points	Exemplary response
1 point	One correct component
0 points	Other

SCORE POINT 2

5 The average weights, in pounds, of 9 different species of kangaroos in Australia are listed below.

70 71 71 72 73 80 83 85 88

What is the MEAN for this set of data?

Mean 77

What is the MODE for this set of data?

Mode 71

On the lines below, identify which measure, mean or mode, is more appropriate to use when describing the size of a kangaroo in Australia. Explain why the measure you chose is more appropriate.

I think the mean is better because it is more in The middle of all the numbers than the mode.

Test 8—Question 5
Score Point 2

This response matches the exemplary response contained in the rubric. The student shows the correct mean and the correct mode and gives a correct explanation for which measure is the most appropriate to use. The response receives a Score Point 2.

Test 8—Question 5
Score Point 1

This response shows the correct mean and the correct mode. However, the student does not give a valid explanation for which measure is the most appropriate. Therefore, this response receives a Score Point 1.

SCORE POINT 1

5 The average weights, in pounds, of 9 different species of kangaroos in Australia are listed below.

70 71 71 72 73 80 83 85 88

What is the MEAN for this set of data?

Mean 77

What is the MODE for this set of data?

Mode 71

On the lines below, identify which measure, mean or mode, is more appropriate to use when describing the size of a kangaroo in Australia. Explain why the measure you chose is more appropriate.

I would say mode because the mean is the averaging of the kangaroo's but the mode is the most often size of the kangaroo's.

SCORE POINT 0

5 The average weights, in pounds, of 9 different species of kangaroos in Australia are listed below.

70 71 71 72 73 80 83 85 88

What is the MEAN for this set of data?

88
70
158

Mean 73

What is the MODE for this set of data?

Mode 158

On the lines below, identify which measure, mean or mode, is more appropriate to use when describing the size of a kangaroo in Australia. Explain why the measure you chose is more appropriate.

The mode because it is the biggest number minus the smallest number. And it is more accurate.

Test 8—Question 5
Score Point 0

This response shows an incorrect mean, an incorrect mode, and an invalid explanation. Therefore, this response receives a Score Point 0.

Test 8—Question 6: Measurement

6 Jennifer has two cardboard rectangles. One rectangle measures $\frac{1}{2}$ foot by $\frac{2}{3}$ foot. The other rectangle measures 3 feet by 2 feet.

What is the total area, in square feet, of the two rectangles?

Show All Work

Answer _____ square feet

Exemplary Response:

- $6\frac{1}{3}$ square feet

Sample Process:

- $\frac{1}{2} \times \frac{2}{3} = \frac{1}{3}$

  $2 \times 3 = 6$

  $6 + \frac{1}{3} = 6\frac{1}{3}$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation OR Correct process for determining area of both rectangles
0 points	Other

SCORE POINT 2

6 Jennifer has two cardboard rectangles. One rectangle measures $\frac{1}{2}$ foot by $\frac{2}{3}$ foot. The other rectangle measures 3 feet by 2 feet.

What is the total area, in square feet, of the two rectangles?

Show All Work

$\frac{1}{2} \times \frac{2}{3} = \frac{2}{6} = \frac{1}{3}$ $\quad 3 \times 2 = 6$

Answer $6\frac{1}{3}$ square feet

Test 8—Question 6 Score Point 2

This response matches the exemplary response contained in the rubric. The student gives the correct answer of $6\frac{1}{3}$ square feet. The response receives a Score Point 2.

SCORE POINT 1

6 Jennifer has two cardboard rectangles. One rectangle measures $\frac{1}{2}$ foot by $\frac{2}{3}$ foot. The other rectangle measures 3 feet by 2 feet.

What is the total area, in square feet, of the two rectangles?

Show All Work

$\frac{1}{2} \times \frac{2}{3} = \frac{3}{6}$

$3 \times 2 = \frac{+\ 6}{6\frac{1}{2}}$

Answer $6\frac{1}{2}$ square feet

Test 8—Question 6 Score Point 1

This response shows a correct complete process. However, the student makes an error in computation when multiplying $\frac{1}{2}$ and $\frac{2}{3}$, which results in an incorrect answer. Therefore, this response receives a Score Point 1.

Test 8—Question 6
Score Point 0

This response shows an incomplete process, which results in an incorrect answer. Therefore, this response receives a Score Point 0.

SCORE POINT 0

6 Jennifer has two cardboard rectangles. One rectangle measures $\frac{1}{2}$ foot by $\frac{2}{3}$ foot. The other rectangle measures 3 feet by 2 feet.

What is the total area, in square feet, of the two rectangles?

Show All Work

$A = 3 \times 2$
$A = 6$
$A =$

Answer 6 square feet

Test 8—Question 7: Algebra and Functions

7 The age of an adult dog in "human years" (h) can be calculated using the formula

$$h = 3 \times (d - 2) + 25$$

where d is the age in dog years.

Using this formula, what will be the age in human years of a dog that is 8 years old in dog years?

Show All Work

Answer _____ years

Exemplary Response:

- 43

Sample Process:

- $h = 3 \times (d - 2) + 25$
  $= 3 \times (8 - 2) + 25$
  $= 3 \times 6 + 25$
  $= 43$

OR

- Other valid process

Rubric:

2 points	Exemplary response
1 point	Correct complete process; error in computation
0 points	Other

Test 8—Question 7
Score Point 2

This response matches the exemplary response contained in the rubric. The student gives the correct answer of 43. The response receives a Score Point 2.

SCORE POINT 2

7 The age of an adult dog in "human years" (h) can be calculated using the formula

$$h = 3 \times (d - 2) + 25$$

where d is the age in dog years.

Using this formula, what will be the age in human years of a dog that is 8 years old in dog years?

Show All Work

h = 3 × (d - 2) + 25
h = 3 × (8 - 2) + 25
h = 3 × 6 + 25
h = 18 + 25
h = 43 yrs

Answer 43 years

Test 8—Question 7
Score Point 1

This response shows a correct complete process. However, the student makes an error in computation when adding 18 and 25, which results in an incorrect answer. Therefore, this response receives a Score Point 1.

SCORE POINT 1

7 The age of an adult dog in "human years" (h) can be calculated using the formula

$$h = 3 \times (d - 2) + 25$$

where d is the age in dog years.

Using this formula, what will be the age in human years of a dog that is 8 years old in dog years?

Show All Work

3 • (8 - 2) + 25
3 • 6 + 25
18 + 25 = 53

Answer 53 years

SCORE POINT 0

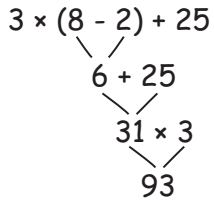
7 The age of an adult dog in "human years" (h) can be calculated using the formula

$$h = 3 \times (d - 2) + 25$$

where d is the age in dog years.

Using this formula, what will be the age in human years of a dog that is 8 years old in dog years?

Show All Work



Answer 93 years

Test 8—Question 7
Score Point 0

This response shows an incorrect process for the order of operations, which results in an incorrect answer. Therefore, this response receives a Score Point 0.

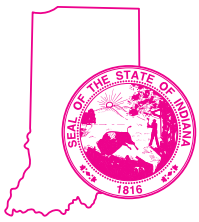
CTB/McGraw-Hill
20 Ryan Ranch Road
Monterey, California 93940-5703
800.538.9547 | www.ctb.com

CTB McGraw-Hill

The McGraw-Hill Companies

Grade 7
Mathematics

Fall 2007
Teacher's Scoring Guide



Indiana Department of Education